

*XII. Experiments made on a great Number of living Animals, with the Poison of Lamas. and of Ticunas, by Mons. Herissant, Doctor of Physic, and F. R. S. Translated from the French, by Tho. Stack, M. D.*

Read Jan. 31. 1750. **M**ONSIEUR de la Condamine, of the royal academy of sciences of Paris, on his return from the voyage, which he made in the inward parts of South America from the coast of the South Sea to the coasts of Brasil and Guiana, by going down the river of the Amazons, brought to Paris a small quantity of a very dangerous poison, much in use among the Indians of Lamas \*, Ticunas, Pevas, and also among the Yameos, who all extract it by fire from divers plants, especially from certain plants, which the French call Lianes.

Those savages are very dextrous at making long trunks, which are the most common weapon used by

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\* Lamas is a Spanish village, or little town, in upper Peru, situated in about seven degrees of south latitude to the west of the river of Guallaga. The native Indians of this district prepare a famous poison for poisoned arrows, different from that of the Yameos, Pevas, and Ticunas, Indian nations, on the borders of the river of the Amazons, towards the mouth of the Napo, in three or four degrees of south latitude.

The poison of Ticunas is the most famous of all for its activity. They say, that that of Lamas sooner loses its force, but that it is properer for certain animals than that of Ticunas. And it is the common opinion, that that of Lamas being mixed with that of Ticunas becomes more violent and active by the mixture.

the Indians for hunting. To them they fit little arrows made of palm-tree, on which they put a little roll of cotton, that exactly fills the bore of the tube. They shoot them with their breath, and seldom or never miss the mark. This simple instrument advantageously supplies the defect of fire-arms among all those nations. They dip the points of these little arrows, as well as of those of their bows, in this poison ; which is so active, that, in less than a minute, especially when fresh, it kills certain animals, from which the arrow has drawn blood.

Monsieur de la Condamine says, in the abridged relation of his voyage, that "when he arrived at Cayenne, " he had the curiosity to try, whether this poison, " which he had kept above a year, still retained its ac- " tivity ; and, at the same time, whether sugar was " really as efficacious a counter-poison as he had been " assured. Both the experiments were performed, says " he, in presence of the commandant of the colony, " of several officers of the garison, and of the king's " physician.

" A hen, slightly wounded with one of these lit- " tle arrows, the point of which had been dipp'd in " the poison thirteen months, at least, before the " trial, blown thro' a trunk, liv'd half a quarter of " an hour: another, prick'd in the wing with one " of these arrows, newly dipp'd in this poison diluted " with water, and immediately drawn out of the " wound, seemed to doze a minute after; con- " vulsions soon came on, and, tho' we had made " her swallow some sugar, she expired. A third, " prick'd with the same arrow, dipp'd again into " the poison, having been instantly assisted by the " same

" same remedy, shew'd no signs of being indisposed,  
" &c."

I was struck with amazement on reading these facts : but my surprize was soon follow'd by a desire of repeating those experiments myself, and even of trying them on different sorts of animals.

Monsieur de la Condamine, to whom I imparted my intention, offered, with the best grace in the world, to satisfy my curiosity, and for that purpose made me a present of a certain quantity of this poison : and the result of the experiments, which I made with this same poison, will be the subject of this memoir.

I will begin the detail of those experiments by that of two accidents, which had like to have disabled me from prosecuting the work I had undertaken ; having very narrowly escaped death.

The first accident happen'd thus : M. de la Condamine had forewarned me, that, when the Indians designed to use their poison (which, in colour, consistence, and even in smell, has a great deal of resemblance with Spanish liquorice) they dissolved it in water, and then evaporated it on a slow fire to the consistence of a soft extract. I made this preliminary preparation in a small closet, in which a young lad was actually at work ; and I did not think of making him quit it, because I did not imagine, that the poison, of which I intended to make trial, could produce any bad effects, without being introduced into the blood, by the opening of a wound. Nor did I then recollect what M. de la Condamine had told me ; which is, that, while they are preparing this poison in the country, they oblige some criminal old woman to take care of the boiling of this

this poison, after shutting her up alone in a separate place: so that, when this woman dies, 'tis a sign, that the poison is sufficiently boil'd, and that it has all the qualities requisite to make it good. But I was soon made sensible of my imprudence: the door of the closet, where the young lad above-mention'd staid, was open; and from the next chamber I saw, that the lad, who had been there about three quarters of an hour, sat still, with his arms across. I began to reprimand him for his laziness; but he excused himself, by answering, with a trembling voice, that he was sick at heart, and felt himself very faint. 'Tis easy to imagine the uneasiness, which this sight gave me; but luckily it cost me no more than the fright. I made the lad come out of the closet immediately, led him down into the yard, and made him swallow a pint of good wine, in which I had dissolved a quart-tern of sugar. He recover'd his strength by degrees, and was soon able to return to his own home, very merry and happy, without the least notion of the danger he had been in. Some days afterwards he came to me, and assured me, that he had not felt the least indisposition since the day in question.

The fact above related was shocking enough to make me abandon my project: however, curiosity got the better of my fear; and I even took a strong fancy to repeat the experiment. It would be inhuman, not to say criminal, to make it on any other person but myself: wherefore I resolved to run the risk, or rather, I persuaded myself, that I should run none, because I should be timely enough to flee from the danger, as soon as the effect of the poison should come to a certain pitch. Besides, I was encouraged by

by the good success of the foregoing example. Therefore I disposed of every thing as at the first time, and I staid in the closet. In about an hour's time I perceived my legs to bend under me, and my arms became so weak, that I could scarcely use them. I had but just time enough to come quickly out of the closet, and get down into the yard; where I order'd wine and sugar to be brought me, as I had before done for the young lad.

Such was the first danger, which I incurred in preparing the American poison: the second was not inferior to it.

After having dissolved the poison of Ticunas in water, and reduced it to the consistence of an extract in the manner above described, I put it into a phial, which I stopped very exactly, and locked up in a desk, till I should have occasion to use it in the experiments, which I intended to make. I began these experiments on the 6 of June 1748; which was so hot a day, that I stripped to my shirt, and had my breast and arms expos'd to the air. In my left hand I held the phial, the cork of which flew up to the cieling with vast rapidity. At the same instant there issued out of this phial a yellowish vapour, of a very penetrating smell, which was soon followed by the extract itself, that spread itself all over the rim of the neck of the bottle. I was so stupified at this unexpected accident, that I imagin'd (as it was very possible) that the bottle was broken in pieces: and as soon as I saw my hands, arms, and breast, colour'd in several places by the poison, which had besprinkled them in the explosion, I look'd on myself as a dead man: which must certainly have been the case, if

the bottle had burst, and the pieces of glass had scratched or cut me. But luckily that did not happen ; and I soon resumed courage ; when, after some minutes, I found myself quite as well as before the explosion of the poison, the effect of which is almost instantaneous ; and it gave me no other trouble than to wash and dry myself very carefully.

From this accident I learned, that this poison, thus prepared, ought not to be put into glass bottles close stopped, but should rather be kept in a glazed earthen pot, covered with paper only ; since it was susceptible of so great an effervescence. Wherefore I put it into a gallypot ; and the experiments, which I made with this same poison a good while afterward, convinced me, that there is no reason to apprehend, that it would lose any of its activity by evaporation.

These two facts plainly shew, how much precaution ought to be taken, when this poison is to be used. And we shall be the better convinced of it, when we consider, that one single drop, conveyed directly into the blood by a puncture, &c. is sometimes sufficient to kill, or at least to cause great disturbance in the animal œconomy. It is quite otherwise, when taken in at the mouth ; for then it does no sort of mischief, as I shall prove in another place.

Let us now pass to the experiments, which I have repeated a number of times on different species of quadrupeds, birds, fishes, insects, and reptiles. But I must first observe, that, of all those animals, none but quadrupeds and birds were killed by this poison, as will more particularly appear by the journal  
of

of my experiments: the others, *viz.* the fishes (*a*), the insects (*b*), and the reptiles (*c*), were not killed, tho' several of them seemed to be disorder'd by it.

I have verified what M. de la Condamine says, in the account of his voyage, relating to the use, that may be made of animals killed by this poison, without apprehending any ill consequences to those, who eat of them. In effect, I have eat rabbits, which I had killed with this poison, and afterwards made several other persons eat of them; and not one of us perceived the least indisposition.

*Journal of the Experiments.*

On the 6 of June 1748, I made a little wound, of about three lines long, in the left hinder leg of a rabbit of six months old: into this wound I put a bit of cotton soaked in the poison of Ticunas: the creature died suddenly in my hands, without giving the least indication of having felt pain, and even before I could apply a bandage to the wound.

The same day I repeated this experiment on eight other rabbits, and on four dogs: they all died in a minute, or thereabout.

The seventh of June of the same year I dipp'd the point of a lancet into the poison: and with this instrument I prick'd four cats and two rabbits, some

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(*a*) Those, which I employed, were the carp, the eel, the pike, the gudgeon, the barbel, and the tench.

(*b*) As caterpillars, bees, different flies of two and four wings, the grillo-talpa, butterflies, may-flies.

(*c*) For example, earthworms, vipers, snakes.

in the head, and the others in the paw. The rabbits died in as short time as the preceding day ; but the cats held out about three minutes. It is to be observed, that each time, that I prick'd an animal, I took care to make a new dip of the lancet into the poison.

The same day I made a little wound about two lines long in the right hinder leg of a rabbit, and put into it a small pledget of cotton soaked in the extract of opium diluted in a little spirit of wine : but this did not cause any disorder in the creature ; nor did arsenic, which I applied to another in the same manner. In fine, to a third I made use of the extract of white hellebore, and I perceived, that this animal became restless, nearly as I had observed in the animals, that died by the effect of the poison of Ticunas. However, this rabbit did not die, but fell into a sudden fit of fury, which went off in about eight minutes. I have likewise made trial of this extract on other rabbits, dogs, and cats ; and the effect was the same, more or less. Of all the extracts, which I employed, as, for example, those of henbane, nightshade, tobacco, &c. I found none but that of white hellebore, that seem'd to raise some little disorder in the animal oeconomy. The essential oil of the *lauro-cerasus* did not incommode the animals, into whose mass of blood I conveyed it, instead of the poison.

The eighth of June, with a lancet I made a very small incision between the ears of a cat, and with a pencil I put into it a drop of the poison of Ticunas mixt with that of Lamas : in an instant the creature died between my hands.

June the ninth, I put some of the same poison into small wounds, which I made in different parts of insects, reptiles, and fishes; and not one of them died of it.

The same day I made a wound, that penetrated into the cavity of the abdomen of a large cat, without hurting any of the contained parts; and, with a crotchet, holding up the integuments, to keep them from touching the abdominal *viscera* of this animal, that lay on its back, I introduced the end of a funnel, and thro' it poured into the cavity of the abdomen about half a drachm of the poison of Lamas mixt with that of Ticunas. By this management I intended, that the edges of the wound should not be wetted with the poison, and that it should touch nothing but the surface of the abdominal *viscera*. I made a suture of one stitch to join the lips of the wound, and I kept the integuments constantly suspended, to prevent their touching the poison: and in this I am certain that I succeeded. At first the creature did not seem to suffer much from this operation; but in an hour's time he died; with such violent convulsions in his throat, that it was almost impossible for him to breathe.

June the tenth, I prick'd with a lancet the left fore leg of a large fat cat, and put in a drop of the poison of the Ticunas. I let this animal run loose about the room, without dressing the wound. By the time he had made a turn round the room, he seem'd very restless and timorous: his legs fail'd him; he lay flat on his belly; and I remarked, that the skin all over his body trembled considerably; the hair of his tail stood up, and his paws were agitated with

a frightful tremor. All this while the animal made no noise: in fine, his head fell all at once between his fore legs, and he died in four minutes after the insertion of the poison.

June the twelfth, I made the same experiment on two other [cats, and on three dogs: these animals seem'd to fall sick almost in an instant: the cats had their hair bristled up, and their bodies gather'd into a heap: they scratched the ground with their fore-feet. The dogs did the same, and all of them had a languishing look, and their eyes bathed in tears: some of them looked at me stedfastly, and made a mournful noise: they were seized with a shivering, and, in fine, they became paralytic in their feet only; after which they died, turning their head very quick to the right and left, with their mouth wide open. During this scene, I perceived a spasmodic contraction in all the muscular parts of the neck.

The fifteenth of July I pricked a hawk in the left claw: into the puncture I introduced a small drop of the poison of Ticunas mixt with that of Lamas, and then set the creature at liberty. From that moment it was impossible for him to fly; the most he could do was to perch on a stick, which was within six inches of the ground. There he shook his head several times, as if to get rid of something that seem'd troublesome in his throat. His eyes were restless, and his feathers were all bristled up. In fine, after several gapings, his head fell all at once between his legs, and he died thus with his wings expanded. The time he spent in dying was three minutes from the insertion of the poison. I repeated this experiment

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on several sorts of birds (a), and they all died with pretty much the same symptoms as those above-mentioned, and in as short a space of time. I made six of these birds swallow a good dose of sugar, before inoculating them with the poison: three of them escaped death, but the other three died very soon. Moreover, the moment after inserting the poison into four other birds, I made them swallow a good deal of sugar; but that did not prevent their dying, almost as soon as those, that had taken none. I made other birds swallow sea-salt instead of sugar; and not one of them recovered, whether they took it before or after the application of the poison.

July the 16, I put a little of the same poison into a small wound, which I had made in the right fore-foot of a young rabbit. The moment this operation was performed, I cut off that foot above the place of insertion of the poison. I dressed the stump, and the animal did not die. Some days afterwards, I repeated this experiment on two large dogs, and on a lamb; and not one of them died.

July the 20, I made a tight ligature on the right hinder leg of a young rabbit, in order to see, if I could thereby prevent the poison from penetrating too quick into the mass of blood. That done, I put a drop of the poison of Ticunas and Lamas into a small wound, which I made below the ligature: but this notwithstanding, the animal died in less than two minutes.

July

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(a) As pigeons, hens, blackbirds, sparrows, ducks, geese, and magpies.

July the 22, I poisoned the point of a sword with the same poison ; and with this sword I pierced the left thigh of a large cat, which died in a minute, without shewing any signs of suffering.

July the 24, after having introduced some of the same poison into little wounds, made in the legs, and other parts, of several dogs, cats, foxes, and horses, I immediately applied a red-hot iron, or burning charcoal, on the wounds : not one of these animals died : but this operation must be performed very speedily.

July the 30, I pricked a great number of rats and mice in the feet with a lancet, after poisoning its point. They all died in less than a minute, after being tormented with a frightful shivering, which was immediately followed by an almost general palsey. The same thing happened to moles, which I made use of for this experiment.

August the 6, I made a small wound in the left hinder leg of a pig of three months old ; and then I put into it two drops of the poison of Ticunas : this creature died in six minutes. I repeated this experiment on two young wolves, which died in the same space of time.

August the 7, I cut off the tip of the ear of six puppies, and rubbed the part with the poison of Ticunas : not one of these animals died of this operation. Two days after, I shaved the hair off of their backs very close, and rubbed the part with the same poison : they all died in less than three minutes.

The 10, 11, and 12 of the same month, into small wounds made in different parts of the body of several dogs, cats, polecats, guinea-pigs, &c. I instill'd seven or eight drops of blood, which I drew from

from the *vena cava* of a dog, which I had killed with the poison of Ticunas mixed with that of Lamas. These animals did not die indeed, but were plainly indisposed ; inasmuch as they lost their vivacity, and became very sullen. Eight days after this experiment, I repeated it on these same animals ; and then they became still weaker and fainter. In fine, the next day I made it a third time on them, when they languished four or five days, and then died.

August the 15, after having put some of the same poison into a wound made in the right hinder leg of six horses, one of which was a very vigorous stone-horse, I quickly bled them all in the neck *ad animi deliquium* : two of them escaped with life ; but those, that were the weakest and most worn out, could not stand against this operation. Two days afterwards, I again pricked those horses, that did not die of the last experiment ; and then they died in about eight minutes.

I made the following observations on these animals, from the insertion of the poison to their death. The muscle, wounded by the incision made for insinuating the poison, was contracted and relaxed alternatively, just as it happens in animals fresh killed : this lasted about two minutes ; after which these animals seem'd restless and impatient, endeavouring to scrape the ground with their fore-foot, which I had suspended in the air with a cord, to prevent their running away. Sometimes also they made a sudden effort, as if to get away, which lasted the space of two minutes ; after which they grew quiet, and amused themselves with nipping the grafts, but not in a natural manner. Then their respiration became

very

very difficult; and, tho' the weather was very hot, there visibly came out of their nostrils a vapour, like that which issues in winter in the time of expiration. A minute after, I observed, that these horses endeavour'd to rest the suspended leg on something: and, in another minute, I perceived the fore-leg, that rested on the ground, beginning to grow weak, and bend; which occasion'd these animals, to fall forward, and rise up again, alternately, with more or less difficulty. In two minutes more, their hind-legs grew weak, and bent under them, like the fore-legs; and, in fine, these animals fell down like a dead lump, without being able to rise again, tho' I whipp'd them heartily. Then their sides began to work, and the whole habit of the body was seized with a dreadful horror. I whipp'd them, and prick'd them with a pin; but in vain; for they gave no sign of feeling. All the muscles of the trunk and extremities were become paralytic; and none retained their action, but those of respiration, and those of the ears and eyes. These creatures continued in this condition about two minutes; after which I observed, that their respiration grew so operose, that each inspiration consisted of three successive attempts, and then followed a most precipitate expiration, accompanied with so violent an hiccup, that, the body bending double, the hind-legs were pulled quite to the fore-legs. In fine, this manner of taking in and letting out breath lasted one minute; in which time their eyes were darkened, and death ensued.

I opened the dead bodies of these horses, and observed as follows:

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The blood was of a deep-brown colour, and spouted out in a full stream, which lasted near a minute, both from the arteries and veins, which I cut. This phænomenon surprized me much, as well as the horse-flayer, who attended me, and assured me that he had never seen the like. The muscles were flaccid, blackish, and very cold. The heart was so violently contracted, that, in cutting it across, I could not see any appearance of the ventricles, until I pull'd their sides aunder by force. The lungs and liver were stuffed with blood.

In making the small wounds, for introducing the poison, great care must be taken, to avoid cutting any trunk of any artery or vein; because, when that happens, the blood, that issues out, carries off a good part of the poison; which makes the animal pine more or less without dying; or, if he dies, it is in a longer or shorter time, according to the quantity of the poison, that has got into the vessels, and been mix'd with the circulating fluid. This thing happen'd to me at M. de Reaumur's house, in trying the experiment on one of his mares, which had been condemned to the laystall. This beast lived above four hours, because the wound bled abundantly, and hinder'd the success of my experiment, for the reasons alleged above.

On the 18 of November I took a little steel arrow, of the following shape and size,



and poisoned it with the poison of Ticunas mix'd  
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with that of Lamas. I caused this arrow to be shot into the right hinder leg of a bear, belonging to M. de Reaumur, which he wanted to have killed, in order to put it into his cabinet of natural history. The creature immediately roared out, from the anguish of the puncture; after which he made a tour round the stable, in which he was, without seeming to be in any pain. Soon afterwards he fell on his side, and died in less than five minutes, having his throat squeezed, as if he had been strangled.

M. le Chevalier de Groflee had an eagle, which he had kept a good while in his court-yard, and intended to make a present of it to M. de Reaumur, to adorn his cabinet, but wanted to know, how to put it to death without damaging the feathers. M. de Reaumur sent him the same arrow above-described, which I had fresh-dipp'd in the poison; it was struck into the wing of this large bird, which dropp'd down dead in an instant.

Such are the chief experiments, which I made with the poison of Ticunas and Lamas: and here follows the result of my observations.

1. In almost all the animals, which I killed with the poison of Ticunas and Lamas, I observed, that, in general, they seemed to feel little or no pain before dying, by the action of this poison.

2. That, before they die, these animals are seized with a sudden and almost universal palsy.

3. Tho' the colour of the blood seemed to me to be altered in certain animals, yet we ought not to draw any inference from thence; because, in many others, the blood had undergone no sort of alteration, either in colour or consistence.

4. That all the muscles are so vastly contracted in the animals thus poisoned, that there is not a drop of blood to be found in them, whatever way you cut into them. These muscles are clammy to the touch, and seem to approach the condition of flesh beginning to be tainted, which feels clammy.

5. That I do not know a more certain rule for determining, that an animal died by the energy of this poison, than this state of the flesh, which feels clammy immediately after death: but a person must have handled it more than once, if he would avoid being mistaken.

6. That the whole mass of blood, during the action of the poison, is carried in abundance into the liver and lungs.

7. That neither sugar nor sea-salt ought to be regarded as a specific antidote; because the poison operates so quick, that it does not allow time to these drugs to act, so as to prevent death. I have found nothing but red-hot iron applied in time, that cures with sufficient certainty.

8. That the more the animal is of a lively and sanguine constitution, the more speedily and forcibly the poison acts.

9. The lustier and fatter the animal is, the more poison and time also are required for producing the expected effects.

Before I make an end, it is worthy of observation, that the poison must be dried on the instrument, before it be struck into the animal, which we intend to kill: for, if it be liquid, it remains on the outside of the wound, while the instrument penetrates into

the flesh: in which case, either the animal dies not at all, or at least with great difficulty: as it happen'd to me at M. de Reaumur's house, with regard to a young wolf, which did not die, tho' the arrow above-mentioned was stuck into one of his thighs; because the poison, which it retained from the dip, continued liquid, and remained on the outside of the wound made by the arrow in piercing the flesh. Wherefore time must be allowed to the poison to grow hard on the instrument, which is intended to be used; that so, entering into the wound together with the weapon, it may be there diluted, and carried in the course of the circulation to those parts which it must affect, in order to cause death.

*XIII. The Case of a Woman, from whom the  
Bones of a Fœtus were extracted. By Mr.  
Thomas Debenham, Surgeon, at Deben-  
ham in Suffolk. Communicated by the Rev.  
Mr. J. Clubb, Vicar of that Parish, to  
William Battie M. D. F. R. S.*

Read Febr. 7.  
1750. **O**N the 25 of April 1749, the wife  
of one Benjamin Last, a cooper,  
in the parish of Debenham, in the county of Suf-  
folk, aged about 34 years, being pregnant of her  
eighth child, had all the symptoms of a woman in  
labour.